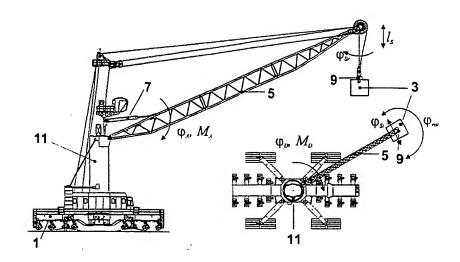
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Fig.1



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Fig. 2

Operator

Hand lever

Set Point

Track control system

31

only for operations with control system

For load oscillation

Damping

Hydraulic actuation system 21 Combustion engine 23

Proportional valve, variable displacement

pump turning mechanism

Motor 27

Proportional valve, variable displacement

Pump seesaw mechanism

Cylinder 29

Crane

Proportional valve, variable displacement

Pump hoisting gear

Motor 27

Proportional valve, variable displacement

Pump load swivel mechanism

Motor 27

Fig. 3

Operator 33

Track control system 31

Crane

Hand lever 34

Module for optimized Movement guidance,

Rotate tower

Fully automated 37

Incline extension arm

Module for optimized Movement guidance.

Underlying control System with load oscillation damping To wind

Movement guidanc Semiautomated 39

36

Set point matrix 35

Load swivel mechanism

Measured values crane position, load position

Fig. 4

Track control system 31 Crane Operator 33 Module for optimized Direct control Rotate tower Hand lever 34 Movement guidance, hydraulics or Incline extension arm Fully automated 37 underlying control System for crane position or speed To wind Module for optimized 41 Movement guidance. Semiautomated 39 Load swivel mechanism Set point matrix 35

Measured values and estimates crane position, load position

Model based estimate load position

Measured values crane position

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Fig.5

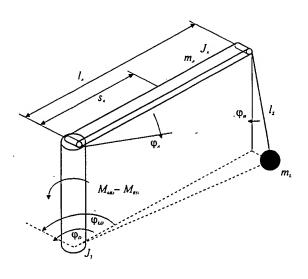
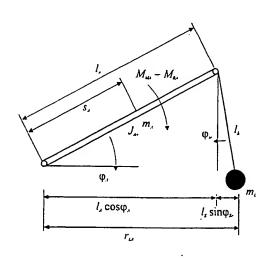


Fig.6



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Fig. 7

Extension Arm

Hydraulic cylinder

Crane tower

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Fig. 8

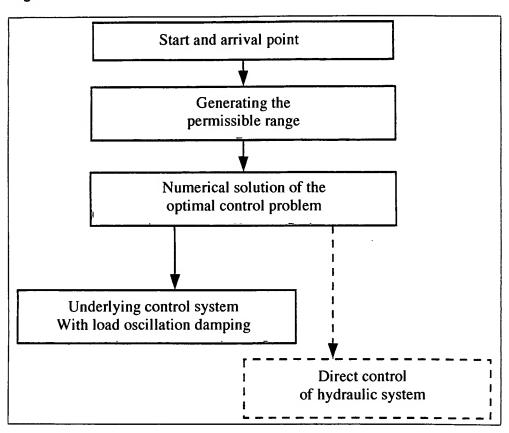


Fig. 9

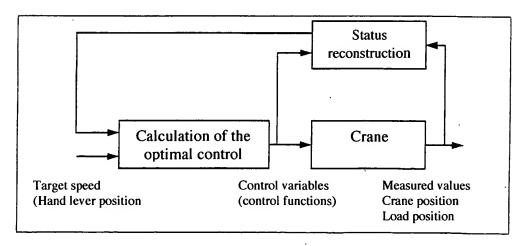


Fig. 10

Time

Time

Fig. 11

Control Voltage Hydraulics Turning Mechanism

Load Angle Speed

Time

Time

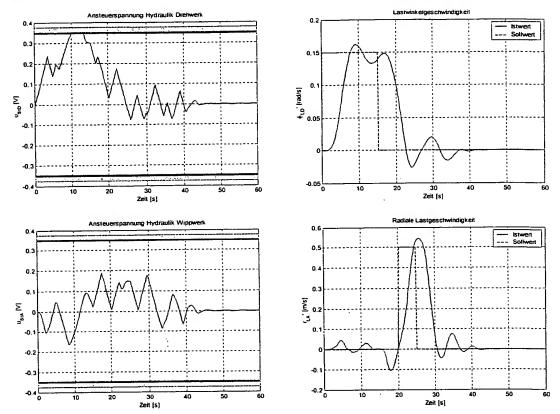
Control Voltage Hydraulics Seesaw Mechanism

Radial Load Speed

Time

Time

Fig. 11



BEST AVAILABLE CORY